REMARKS

Summary of Amendments

The specification has been amended to correct the informalities, as required by the Examiner.

Claim 1 has been amended to add a limitation to an element recited therein; claim 12 has been amended to correct an informality of the same sort as the other instances in the rest of the specification; claims 2-11, 13 and 14 remain in their original form.

Specification

The specification was objected to because of informalities in that the instances in which the Greek letter *mu* (μ) was supposed to appear before "m"—instances meant to indicate micron units following given numerical values—are garbled. The garbled text has been appropriately corrected in amendments amounting to formal corrections only; of course no new matter has been added.

The illegibility of "μ" would seem to be an artifact of the submission of the present application by means of the USPTO's Electronic Filing System. When Applicant's representative submitted the present application, versions of the specification printed out via browser display and via "ePAVE" (the USPTO's proprietary electronic submission software)—and still viewable—on Applicant's end did not then, and do not now, contain illegible text.

Claim Rejections - 35 U.S.C. § 102

Claims 1-8, 10, 13 and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 6,310,755 to Kholodenko et al.

In turn, claims 1-3, 5-9, 13 and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,968,273 to Kadomura et al.

These separate rejections will be addressed concurrently.

Both of the patents cited in making the § 102 rejections disclose electrostatic chucks that include special means for controlling temperature of a process wafer held on the chuck. In the Kholodenko et al. device, a cavity(ies) is provided in a chuck base/support for removing heat from the base/support. In the Kadomura et al.

device, a "temperature-adjusting jacket," to which a temperature-adjusting means is connected, is provided underneath the electrostatic chuck.

There is no metal plate under the heater-containing part of the Kholodenko et al. chuck—only a "bond layer" made of metal. In Kadomura et al. there is a metal plate disposed directly underneath and in contact with the heater. The alleged metal plate analogue (i.e. the bond layer) in Kholodenko et al. is for transferring heat below and away from the heater. The metal plate in Kadomura et al. is for transferring "heating or cooling energy from the temperature-adjusting jacket . . . to the heater" (column 3, lines 5-7).

That is, the Kholodenko et al. and Kadomura et al. references are directed to electrostatic chucks in which the metal plate or its analogue is for drawing heat away from, or transferring heat to, the electrostatic-chuck heater, not for reflecting heat from a susceptor heater back toward the susceptor's process-object retaining side. (The cavity(ies) in the Kholodenko et al. base/support are for cooling, and indeed the base itself is described as being a "heat sink." In Kadomura et al. the metal plate functions in conjunction with, to transfer heat from or to, the temperature-adjusting jacket on which it rests.)

In the present invention, in contrast, the metal plate is for reflecting heat upwards to the process-object retaining side of the susceptor. The purpose of the metal plate in the present invention is to reflect heat from the resistive heating element, to promote "heat diffusion toward the retaining side to further enhance the temperature uniformity of the retaining side" (paragraph [0022] of the present specification).

Thus, the present invention in the configuration as recited in claim 1 reflects heat from the resistive heating element through the susceptor to the processed-object retaining side of the susceptor.

Furthermore, claim 1 has been amended to recite that the resistive heating element is "patterned in a circuit having a pattern spacing of 0.1 mm or more." Thus, as set forth in paragraph [0049] of the present specification, the heating element in the present invention is formed in a pattern conformed so that no portion of the element is closer than 0.1 mm to any other portion of the element.

Applicant notes that both the Kholodenko et al. reference and the Kadomura et al. reference are silent as to such pattern spacing, much less as to the incidence of (i.e., whether there even is) leakage current in a heating element circuit in which the pattern spacing has been made 0.1 mm or more. In particular, the present invention is in the first place a wafer holder in which the primary emphasis is placed on enhancing temperature uniformity in the surface of a process object retained on the holder susceptor. The spacing in the heating-element circuit pattern is rendered

a predetermined extent or more, in order that heating-circuit leakage current that would otherwise interfere with the implementation of the present invention not occur. Neither the Kholodenko et al. reference nor the Kadomura et al. reference has anything to say with regard to the effectiveness of eliminating heating-circuit leakage current so as to enhance temperature uniformity.

It is respectfully submitted that for the foregoing reasons claim 1 in its current form should be held allowable, and thus the remaining claims rejected under this section of the Office action—claims 2-10, and 13 and 14—should be held allowable as depending from an allowable base claim.

Rejections under 35 U.S.C. § 103

Claim 11: Kholodenko et al. '755 or Kadomura et al. '273 in view of Hiramatsu et al. '006

Claim 11 was rejected as being unpatentable over either of the Kholodenko et al. and Kadomura et al. references in view of U.S. Pat. No. 6,507,006 to Hiramatsu et al.

Hiramatsu et al., like Kholodenko et al. and Kadomura et al., is directed to electrostatic chucks. In column 12, line 31, Hiramatsu et al. does mention a porosity that is preferably from 0.01 to 3%, but this porosity is of a ceramic dielectric film 4 that is formed on electrostatic electrode layers 2 and 3 buried in a ceramic substrate 1. In other words, the stipulated porosity is not of the ceramic substrate itself. The given porosity is so that "gas and so on" that would otherwise "lower the breakdown voltage" of the ceramic film does not "penetrate through the ceramic dielectric film to corrode the electrostatic electrodes" (column 11, lines 25-27).

The porosity recited in claim 11 of the present application is for a totally different purpose, and is a limitation on the susceptor as claimed, not on some film formed on a ceramic substrate as in Hiramatsu et al. As explained in paragraph [0028] of the specification for the present invention, if the susceptor ceramic is too porous the time required to pump down the process chamber impairs effective throughput.

Notwithstanding the foregoing arguments, it is respectfully submitted that the patentability of the present claims rests in claim 1, not solely in claim 11. And claim 11 should be held allowable as depending from a base claim 1 allowable for the reasons set forth above in addressing the rejections under 35 U.S.C. § 102.

App. No. 10/708,301
Amendment dated January 31, 2005
Reply to Office action of November 1, 2004

Claim 12 Kholodenko et al. '755 or Kadomura et al. '273 in view of Ito et al. '116

Claim 12 was rejected as being unpatentable over either of the Kholodenko et al. and Kadomura et al. references in view of U.S. Pat. No. 6,717,116 to Ito et al.

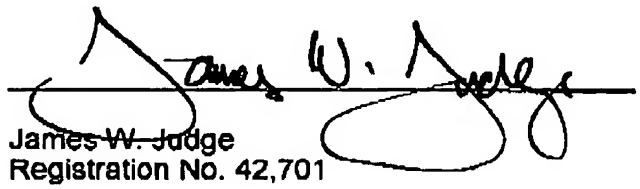
Ito et al. teach controlling flatness, in a semiconductor wafer-mounting surface of a ceramic heater substrate, to be expressly 1 to 50 μm. This is lower by an order of magnitude than the limitation set forth in claim 12 of the present application. The synergistic effect of the claimed combination set forth in claims 1 and 12 of the present application would not arise in the combination of the teachings of the Kholodenko et al. and Kadomura et al. disclosures together with the Ito et al. teachings, because, as stated above, the Kholodenko et al. and Kadomura et al. references are directed to electrostatic chucks in which the metal plate or its analogue is for drawing heat away from, or transferring heat to, the electrostatic-chuck heater, not for reflecting heat from a susceptor heater back toward the susceptor's process-object retaining side, as is the case in the present invention.

It is respectfully submitted, moreover, that claim 12 should be held allowable as depending from a base claim 1 allowable for the reasons set forth above in addressing the rejections under 35 U.S.C. § 102.

Accordingly, Applicant courteously urges that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

January 31, 2005



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